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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,662	07/31/2001	Munehisa Horiguchi	EQU-C114	1521

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LORUSSO & LOUD  
3137 Mount Vernon Avenue  
Alexandria, VA 22305

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 09/12/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/917,662

Applicant(s)

HORIGUCHI ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09/213,241.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Information Disclosure Statement*

1. The commonly owned patents and applications listed on the first page of the IDS filed on October 24, 2001 (paper no. 4) have been considered, but have not been officially made of record unless otherwise noted on the accompanying Notice of References Cited.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-7, 11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19648995. U.S. Patent 6,376,110 to Koschany is taken as an English-language equivalent of DE '995. Regarding claim 1, Koschany '110 is directed to a fuel cell comprising a proton exchange membrane electrolyte (4) and grooved bipolar separator plates (6) adjacent the cathode (2) (see abstract; Fig. 1). The grooves of the separator extend continuously in completely spanning the separator surface between the edges thereof. Hydrogen is supplied to the anode, while air is supplied to the cathode (see Fig. 1). Liquid water is sprayed from a nozzle (17) into the first end of the grooves and into contact with a surface of the cathode, thereby maintaining the electrolyte membrane in a moist condition (see Fig. 1; col. 5, line 53 et seq.). Regarding claims 3 and 4, the optimum quantity of spray water is calculated as the quantity determined to maintain a proper

moisture content within the electrolyte membrane and the amount of sprayed water is subsequently controlled (see col. 6, line 62 et seq.). Regarding claim 7, this quantity of water also maintains the temperature of the fuel cell within a predetermined temperature range (see col. 7, lines 6-10). Regarding claims 5 and 6, the water is sprayed directly onto the surface of the cathode and is dispersed over the entire surface thereof (see col. 5, line 32; col. 6, lines 55-61). Regarding claim 11, the membrane has a thickness that allows water to permeate therethrough (see col. 5, line 43). Regarding claim 14, the separator grooves are vertically oriented, whereby the supplied water falls by gravity in traversing the grooves (see Fig. 1).

Thus, the instant claims are anticipated.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19648995 in view of Sanderson et al (U.S. Patent 5,085,949).

DE '995 (Koschany '110) is applied to claims 1, 3-7, 11, and 14 for the reasons stated above. However, the reference does not expressly teach that the quantity of water sprayed is controlled in response to the output voltage of the fuel cell, as recited in claim 2.

Sanderson et al. is directed to a fuel cell generation system wherein an abnormal state in the cooling unit is detected based on the output voltage of the fuel cell (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to control the quantity of water of the system of Koschany in response to the output voltage of the fuel cell. In column 5, line 20, Sanderson et al. teach that "the system is capable of rapidly and positively detecting an abnormal state where the upper stacked cell temperature rises to a predetermined temperature or more. It results in preventing the breakdown of the cell caused when the system is kept operating the abnormal state and offering a great effect in light of safety of the fuel cell and plant operation." Accordingly, the artisan would be motivated to control the quantity of water of the system of Koschany in response to the output voltage of the fuel cell.

6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19648995 in view of JP 5-29013.

DE '995 (Koschany '110) is applied to claims 1, 3-7, 11, and 14 for the reasons stated above. However, the reference does not expressly teach that the quantity of water sprayed is controlled in response to the output power of the fuel cell, as recited in claims 8 and 9.

In the abstract, JP 5-29013 discloses a fuel cell system in which the flow rate of the cooling water is controlled in response to the output power of the fuel cell.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to control the quantity of water of the system of Koschany in response to the output power of the fuel cell. In the abstract, JP '013 teaches that the power generation system is operated "optimally" by controlling it in this manner. Accordingly, the artisan would be motivated to control the quantity of water of the system of Koschany in response to the output power of the fuel cell.

7. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19648995 in view of Watkins et al (U.S. Patent 5,200,278).

DE '995 (Koschany '110) is applied to claims 1, 3-7, 11, and 14 for the reasons stated above. Regarding claim 13, DE '995 (Koschany '110) further teaches in column 7, line 15 that the air/water mixture leaving the cathode is recirculated.

However, the reference does not expressly teach that water is separated from the cathode exhaust gas, as recited in claim 12.

In column 8, line 61 et seq., Watkins et al. teach a water separator (174) which removes the water from the cathode exhaust stream (170).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to separate the water from the cathode exhaust gas of Koschany before recirculating the water to the nozzle. In column 3, line 6, Watkins et al. teach that "[w]hen using substantially pure reactants, the unconsumed reactants exiting the fuel cell stack are recirculated to minimize waste. Water in the

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gas stream exiting the fuel cells is accumulated in a separator or knockout drum, where the water can be recirculated and used as a coolant or drained from the system.” Accordingly, the artisan would be motivated to separate the water from the cathode exhaust gas of Koschany before recirculating the water to the nozzle.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DE 19648995 in view of Kleinberger et al (U.S. Patent 5,350,117).

DE ‘995 (Koschany ‘110) is applied to claims 1, 3-7, 11, and 14 for the reasons stated above. However, the reference does not expressly teach that water is sprayed at a predetermined constant pressure over a predetermined time.

In column 1, line 58, Kleinberger et al. teach a humidifying apparatus in which water is sprayed at constant pressure for predetermined cycle periods.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to spray the water of Koschany at predetermined constant pressure for a predetermined time. In column 1, line 55, Kleinberger et al. describe this arrangement as “preferred.” Furthermore, in column 10, line 52, the reference teaches that “[s]ince the amount of water pressure affects the quality of mist emitted from the mist nozzles 59, the pressure regulator 901 and the feedback line 92 help to ensure optimum mist quality.” Accordingly, the artisan would be motivated to spray the water of Koschany at predetermined constant pressure for a predetermined time.

### *Double Patenting*

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1, 3-7, 11, and 14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-21 and 23 of U.S. Patent No. 6,537,692 (Horiguchi et al.) in view of DE 19648995 (Koschany '110). The claims of the '692 patent do not expressly recite the structure of the fuel cell or that the water is sprayed, as recited in claim 1 of the instant application. However, Koschany '110 teaches the claimed features, as set forth in section 3 above. The artisan would be motivated to use the system and method of Koschany '110 in the method of the '692 patent claims because Koschany '110 teaches in column 1, lines 52-57 that an object of his invention is to ensure that the membrane of a fuel cell "has the optimum moisture content at all times during operation." Accordingly, the instant claims define an obvious variation of the method recited in the '692 patent claims.



11. Claim 2 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-21 and 23 of U.S. Patent No. 6,537,692 in view of DE 19648995 (Koschany '110) and further in view of Sanderson et al (U.S. Patent 5,085,949).

The '692 patent claims do not expressly recite that the quantity of water sprayed is controlled in response to the output voltage of the fuel cell, as recited in claim 2.

Sanderson et al. is directed to a fuel cell generation system wherein an abnormal state in the cooling unit is detected based on the output voltage of the fuel cell (see abstract). In column 5, line 20, Sanderson et al. teach that "the system is capable of rapidly and positively detecting an abnormal state where the upper stacked cell temperature rises to a predetermined temperature or more. It results in preventing the breakdown of the cell caused when the system is kept operating the abnormal state and offering a great effect in light of safety of the fuel cell and plant operation." Accordingly, the artisan would be motivated to control the quantity of water of the system of the '692 claims in response to the output voltage of the fuel cell.

12. Claims 8 and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-21 and 23 of U.S. Patent No. 6,537,692 in view of DE 19648995 (Koschany '110) and further in view of JP 5-29013.

The '692 patent claims do not expressly recite that the quantity of water sprayed is controlled in response to the output power of the fuel cell, as recited in claims 8 and 9.

In the abstract, JP 5-29013 discloses a fuel cell system in which the flow rate of the cooling water is controlled in response to the output power of the fuel cell. In the abstract, JP

'013 further teaches that the power generation system is operated "optimally" by controlling it in this manner. Accordingly, the artisan would be motivated to control the quantity of water of the system of the '692 claims in response to the output power of the fuel cell.

13. Claims 12 and 13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-21 and 23 of U.S. Patent No. 6,537,692 in view of DE 19648995 (Koschany '110) and further in view of Watkins et al (U.S. Patent 5,200,278).

The '692 patent claims do not expressly teach that water is separated from the cathode exhaust gas and recirculated, as recited in claims 12 and 13.

In column 8, line 61 et seq., Watkins et al. teach a water separator (174) which removes the water from the cathode exhaust stream (170). In column 3, line 6, Watkins et al. teach that "[w]hen using substantially pure reactants, the unconsumed reactants exiting the fuel cell stack are recirculated to minimize waste. Water in the gas stream exiting the fuel cells is accumulated in a separator or knockout drum, where the water can be recirculated and used as a coolant or drained from the system." Accordingly, the artisan would be motivated to separate the water from the cathode exhaust gas the system of the '692 claims before recirculating the water to the nozzle.

14. Claim 10 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 12-21 and 23 of U.S. Patent No. 6,537,692 in view of DE 19648995 (Koschany '110) and further in view of Kleinberger et al (U.S. Patent 5,350,117).

The '692 patent claims do not expressly teach that water is sprayed at a predetermined constant pressure over a predetermined time.

In column 1, line 58, Kleinberger et al. teach a humidifying apparatus in which water is sprayed at constant pressure for predetermined cycle periods. In column 1, line 55, Kleinberger et al. describe this arrangement as "preferred." Furthermore, in column 10, line 52, the reference teaches that "[s]ince the amount of water pressure affects the quality of mist emitted from the mist nozzles 59, the pressure regulator 901 and the feedback line 92 help to ensure optimum mist quality." Accordingly, the artisan would be motivated to spray the water of the system of the '692 patent claims at predetermined constant pressure for a predetermined time.

### *Conclusion*

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally,


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documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

September 5, 2003

  
JONATHAN CREPEAU  
PATENT EXAMINER  
ART UNIT 1746